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ABSTRACT

To assess the relationship between specific neonatal variables and subsequent mental development, a longitudinal study of 41 children from a high-risk neonatal nursery was conducted. For each child, 58 measures of neonatal condition (e.g., head size, various laboratory values, delivery mode) were available, as were developmental assessments up to 6 years of age. Mental status instruments used included the Stanford Binet, the Peabody Picture Vocabulary Test, the Beery Developmental Test of Visual Motor Integration, the Wechsler Preschool and Primary Scale of Intelligence, and the Vineland Social Maturity Scale. Each variable relating to neonatal condition was correlated with performance at 6 years for each test. Multiple stepwise regression analyses were computed for all neonatal condition variables; each individual test constituted the criterion variable. Results suggested that at 6 years of age specific neonatal conditions may affect specific aspects of mental function more than they affect global aspects of mental status. (Extensive tables of data and Pearson correlation coefficients are provided.) (RH)

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Birth Conditions Associated With Mental States at Age Six

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Forty one children were followed from birth to six years. Fifty eight neonatal conditions (eg, head size, various laboratory values, delivery mode) were correlated with results of mental status examination, including language, perceptuomotor, and IQ measures at age six. Specific neonatal conditions correlated with specific mental findings.

SOUTHWESTERN PSYCHOLOGICAL ASSOCIATION, April, 1983

San Antonio, Texas

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Birth Conditions Associated With Mental Status at Age Six

Child Development

Preschool

Handicaps of Childhood

Problem

Although there is considerable evidence that adverse birth conditions may have implications for mental problems which do not become manifest until age of readiness for school entry, there has been little longitudinal study of children at risk for a high incidence of neonatal problems to assess the nature and extent of the relationship between specific neonatal variables and subsequent mental development.

Method

This project studied forty one children from a high risk neonatal nursery. Mean six year old Binet IQ was 90. For each child, fifty eight measures of neonatal condition were available, as was developmental assessment up to age six. Mental status instruments included the Stanford Binet, the Peabody Picture Vocabulary Test, Beery Developmental Test of Visual Meter Integration, WPPSI, and Vineland Social Material Scale. Each neonatal condition variable was correlated

with six year performance on each test. A subsequent multiple stepwise regression analysis was computed for all neonatal condition variables, using each individual test as the criterion variable.

Results

With six year Binet IQ, duration of labor (-.33), trauma (-.37), respiratory distress (-.32), and duration of hospitalization (-.37) were medical variables correlated at significant levels. With the WPPSI verbal IQ correlated with respiratory distress (.55), temperature (.43), maternal eclampsia (-.53) and tachypenia (-.40), and with WPPSI performance IQ maternal henoglobinopathy (-.50), were correlates. Multiple regression analyis did not account for more that 40% of the variance associated with test scores, even when the majority of neonatal condition variables were included. Data suggest that specific neonatal conditions may effect specific aspects of mental function (ex. specific neonatal problems correlate with specific deficit areas reflected on specific subtests or ability measures), rather than with more global aspects of mental status at age six.

MEAN DEVELOPMENTAL QUOTIENTS

FOR EACH AGE LEVEL

AGE	N	DQ
6 months	264	91
12 months	224	95
18 months	165	95
24 months	156	90
36 months	123	81
48 months	77	93
60 months	65	88
72 months	44	90

BIRTH NUMBER AND DEVELOPMENTAL QUOTIENTS
at 12, 18, 24, 36, 48, 60, & 72 months.

	12mos.	18mos.	24mos.	36mos.	48mos.	60mos.	72mos
Single Birth	96	96	92	82	95	89	90
Twin Birth	84	88	82	72	83	83	101
T Value	2.63	1.45	1.70	2.25	2.74	.93	4.23
p=	.015	.164	.109	.048	.017	.375	.000

RESPIRATORY DISTRESS SYNDROME

AND CHRONOLOGICAL AGE DEVELOPMENTAL QUOTIENTS

At 6, 12, 18, 24, 36, 48, 60, and 72 MONTHS

	* 6 Mos.	* 12 Mos.	18 Mos.	24 Mos.	36 Mos.	48 Mos.	60 Mos.	72 Mos.
RESPIRATORY DISTRESS	** 82	** 89	* 91	90	81	* 101	91	92
NO RESPIRATORY DISTRESS	97	98	98	91	81	90	87	90

Temperature During Transport

And D.Q. at 6, 12, 18, 24, 36, 48, 60, and 72 Months

Temperature (° C)	D.Q. 6 Mos.	12 Mos.	18 Mos.	24 Mos.	36 Mos.	48 Mos.	60 Mos.	72 Mos.
34	95	* 107	96	90	61	82	--	--
35	94	99	95	87	74	81	77	81
36	99	103	97	95	80	93	96	94
37	92	94	97	89	80	91	86	86
38	95	84	86	99	92	108	103	108
39	82	95	96	85	79	93	96	111
40	80	63	97	77	--	--	--	--

MODE OF DELIVERY AND MEAN DEVELOPMENTAL

QUOTIENTS AT EIGHT AGE LEVELS

	6 Mos.*	12 Mos.	18 Mos.	24 Mos.	36 Mos.	48 Mos.	60 Mos.	72 Mos.
C-Section	* 99	99	98	93	85	94	94	92
Vertex	91	93	94	90	80	94	88	89
Frank Breech	76	99	101	104	--	94	--	--
Footling Breech	82	94	98	93	79	89	83	91

* p .005

Mean Developmental Quotient

For Children Born at Term, Preterm, and Postterm

	6 Mo.*	12 Mo.*	18 Mo.	24 Mo.	36 Mo.	48 Mo.	60 Mo.	72 Mo.
Preterm	** 82	** 90	* 93	90	79	92	89	92
Fullterm	104	101	99	92	84	93	88	89
Postterm	98	89	84	92	84	93	81	85

* p .001

PEARSON CORRELATION COEFFICIENTS
FOR PARENTAL EDUCATION

	Maternal Education	Paternal Education
6 months Cattell	-.03	-.01
12 months Cattell	-.09	-.13
18 months Cattell	.06	.08
24 months Cattell	.12	.19
24 months VSMS	-.05	-.09
36 months Stanford-Binet	.22*	.24*
36 months VSMS	-.09	-.24
Beery	.10	.14
PPVT	.43**	.58**
48 months WPPSI-V	.35*	.43*
48 months WPPSI-P	.26*	.27
48 months WPPSI-FS	.58**	.59**
60 months Stanford-Binet	.52**	.58**
72 months Stanford-Binet	.26	.41

** p .001
* p .05

PEARSON CORRELATION COEFFICIENTS
FOR PARENTAL AGE

	Maternal Age	Paternal Age
6 months Cattell	.13*	.07
12 months Cattell	.06	.12
18 months Cattell	.21*	.21*
24 months Cattell	.16*	.17
24 months VSMS	.23*	.06
36 months Stanford-Binet	.38**	.19
36 months VSMS	.005	.22
Leery	.08	.23
PPVT	.24*	.06
48 months WPPIS-V	.37**	.34*
48 months WPPSI-P	.21*	.22
48 months WPPSI-FS	.32*	.15
60 months Stanford-Binet	.33*	.16
72 months Stanford-Binet	.23	.03

** p .001
* p .05

PEARSON CORRELATION COEFFICIENTS

	NUMBER OF DAYS IN HOSPITAL	NUMBER OF DAYS IN TERTIARY CENTER
6 months Cattell	-.60**	-.53**
12 months Cattell	-.49**	-.47**
18 months Cattell	-.41**	-.40**
24 months Cattell	-.36**	-.35**
24 months VSMS	-.27*	-.23*
36 months Stanford-Binet	-.33*	-.27*
36 months VSMS	-.09	-.12
Beery	-.35*	-.33**
PPVT	-.13	-.02
48 months WV	-.01	.04
48 months WP	.009	.005
48 months WFS	-.09	-.03
60 months Stanford-Binet	-.10	-.14
72 months Stanford-Binet	.05	-.09

** p .001
* p .05

PEARSON CORRELATION COEFFICIENTS
FOR HEAD CIRCUMFERENCE

6 months Cattell	.51**
12 months Cattell	.21*
18 months Cattell	.10
24 months Cattell	.18*
24 months VSMS	.18
36 months Stanford-Binet	.39**
36 months VSMS	-.006
Beery	.26*
PPVT	.07
48 months WPPSI-V	.17
48 months WPPSI-P	.24*
48 months WPPSI-FS	.31*
60 months Stanford-Binet	.11
72 months Stanford-Binet	.01

** p .001
* p .05

PEARSON CORRELATION COEFFICIENTS
FOR BIRTH WEIGHTS

6 months Cattell	.63**
12 months Cattell	.32**
18 months Cattell	.28**
24 months Cattell	.25**
24 months VSMS	.15
36 months Stanford-Binet	.32**
36 months VSMS	.05
Beery	.19*
PPVT	.07
48 months WPPSI-V	.05
48 months WPPSI-P	.13
48 months WPPSI-FS	.16
60 months Stanford-Binet	.18
72 months Stanford-Binet	-.09

** p .001
* p .05

MEAN DQ/IQ QUOTIENTS FOR WHITE AND BLACK CHILDREN

	WHITE	BLACK
6 months Cattell	90	93
12 months Cattell	93	96
18 months Cattell	95	96
24 months Cattell	92	89
36 months Stanford-Binet	*86	78
36 months PPVT	*87	78
36 months Beery	93	93
48 months WPPSI-V	**101	85
48 months WPPSI-P	*98	86
48 months WPPSI-FS	**102	86
60 months Stanford-Binet	**100	82
72 months Stanford-Binet	*99	86
24 months VSMS	119	115
36 months VSMS	107	115

MEAN DQ/IQ QUOTIENTS FOR MALE AND FEMALE

	MALE	FEMALE
6 months Cattell	93	89
12 months Cattell	96	94
18 months Cattell	96	94
24 months Cattell	91	89
36 months Stanford-Binet	79	83
36 months PPVT	80	83
36 months Beery	91	96
48 months WPPSI-V	90	94
48 months WPPSI-P	90	92
48 months WPPSI-Fs	92	95
60 months Stanford-Binet	*82	93
72 months Stanford-Binet	85	94
24 months VSMS	116	117
36 months VSMS	*106	119

* $p < .05$
** $p < .005$

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And D.Q. at 6, 12, 18, 24, 36, 48, 60, and 72 Months

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37	92	94	97	89	80	91	86	86
38	95	84	86	99	92	108	103	108
39	82	95	96	85	79	93	96	111
40	80	63	97	77	--	--	--	--

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Fullterm	104	101	99	92	84	93	88	89
Postterm	98	89	84	92	84	93	81	85

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